INDEX
DIVISION 1 - GENERAL REQUIREMENTS

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# SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 GENERAL.

1.1 MOBILIZATION AND DEMOBILIZATION. Payment will be made for costs associated with mobilization and demobilization, as defined in DFARS Clause 252.236-7004.

1.2 CLEARING, GRUBBING AND STRIPPING. Payment for clearing, grubbing and stripping will be made at the contract lump sum price for "Clearing, Grubbing and Stripping", which price and payment shall constitute full compensation for providing all plant, labor, material, and equipment and performing all operations necessary to complete the clearing and grubbing specified in SECTION 02110 - CLEARING, GRUBBING, AND STRIPPING and as shown on the drawings.

1.3 REMOVALS AND DEBRIS CLEARING. Payment for removals and debris clearing will be made at the contract lump sum price for "Removals and Debris Clearing", which price and payment shall constitute full compensation for providing all plant, labor, material, and equipment and performing all operations necessary to complete the work specified in SECTION 02111 - REMOVALS AND DEBRIS CLEARING and shown on the drawings.

1.4 EMBANKMENT.

1.4.1 Measurement. Unless otherwise specified, the required embankment and fill and backfill materials will be measured for payment by the cubic yard, and quantities will be determined by the average end area method. The basis for the measurement will be cross sections of the areas to be filled taken prior to clearing, grubbing, and stripping and the theoretical cross sections of the completed levee, including inspection trench.

1.4.2 Payment. Payment for all embankment material placed as required in embankments, ramps, backfill, and inspection trench, will be made at the applicable contract unit price per cubic yard for “Embankment”, which prices and payments shall constitute full compensation for furnishing all plant, labor, equipment and material, and performing all operations necessary for foundation preparation, placing and compacting the material, as described in SECTION 02221 - EMBANKMENT; and as shown on the drawings.

1.5 EXCAVATION.

1.5.1 Measurement. Unless otherwise specified, the required excavation will be measured for payment by the cubic yard, and quantities will be determined by the average end area method. The basis for the measurement will be cross sections of the areas to be excavated taken prior to clearing, grubbing, and stripping and the theoretical cross sections of the completed levee, including inspection trench.

1.5.2 Payment. Payment for all excavated material required for excavation in the borrow area, required excavations, excavation in other areas and hauling of excavated materials to fills, backfills and disposal areas will be made at the applicable contract unit price per cubic yard for “Excavation”, which prices and payments shall constitute full compensation for furnishing all plant, labor, equipment and material, and performing all operations necessary, as described in SECTION 02220 - EXCAVATION; and as shown on the drawings.

1.6 CRUSHED STONE SURFACING.

1.6.1 Measurement. Crushed stone surfacing will be measured for payment by the ton (2000 lbs.) The weights to be paid for will be determined from certified weight tickets which shall be furnished by the Contractor at no additional cost to the Government. A certified weight ticket shall be defined as each truck being weighed empty, and again when loaded and the ticket, identified by the Contractor's name and the contract number, signed by the approved quarry representative with the statement "certified correct." This procedure shall be followed for each load hauled. The Contractor shall initial each ticket to reflect verification of the accuracy and completeness of each ticket before submitting it to the Government. Certification stating the scales used were tested and approved by the local authority shall be furnished by the Contractor. Final quantities will be taken to the nearest whole ton.

1.6.2 Payment. Payment for the crushed stone surfacing will be made at the contract unit price per ton for "Crushed Stone Surfacing", which price and payment shall constitute full compensation for the costs of all materials, labor and equipment required to complete the crushed stone surfacing as specified in SECTION 02230 - CRUSHED STONE SURFACING and as shown on the drawings.

1.7 RIPRAP, 90 Lb. Topsize.

1.7.1 Measurement. Riprap will be measured for payment by the ton (2,000 lbs.) as specified above in paragraph 1.6.1.

1.7.2 Payment. Payment for riprap will be made at the applicable contract unit price per ton for "Riprap, 90-Lb Topsize” subdivided items, which prices and payments shall constitute full compensation for all costs of furnishing, hauling, handling, placing and maintaining the riprap as specified in SECTION 02270 - STONE PROTECTION.

1.8 SIX-INCH MINUS MATERIAL.

1.8.1 Measurement. Six-inch minus material will be measured for payment by the ton (2,000 lbs.) as specified above in paragraph 1.6.1.

1.8.2 Payment. Payment for 6-inch minus material will be made at the contract unit price per ton for "6-Inch Minus Material" subdivided items, which price and payment shall constitute full compensation for all costs of furnishing, hauling, handling, placing and maintaining the 6-inch minus material as specified in SECTION 02270 - STONE PROTECTION.

1.9 CRUSHED STONE BEDDING MATERIAL.

1.9.1 Measurement. Crushed stone bedding material will be measured for payment by the ton (2,000 lbs.) as specified above in paragraph 1.6.1.

1.9.2 Payment. Payment for crushed stone bedding material will be made at the contract unit price per ton for "Crushed Stone Bedding Material" subdivided items, which price and payment shall constitute full compensation for all costs of furnishing, hauling, handling, placing and maintaining the crushed stone bedding material as specified in SECTION 02270 - STONE PROTECTION.

1.10 CORRUGATED STEEL PIPE CULVERT. Payment for the 15-inch diameter corrugated steel pipe with end sections and appurtenances specified in SECTION 02612 - CORRUGATED STEEL PIPES will be made at the applicable contract lump sum price for "Corrugated Steel Pipe Culvert, 15-Inch Diameter”, which prices and payments shall constitute full compensation for the new pipe complete, including excavation specified in SECTION 02220 - EXCAVATION; foundation preparation and backfilling specified in SECTION 02221 - EMBANKMENT; and

miscellaneous metals specified in DIVISION 5, METALS.

1.11 GUARDRAIL BARRICADES. Payment for the guardrail barricades specified in SECTION 02840 - GUARDRAIL BARRICADES AND GATES will be made at the contract lump sum price for "Guardrail Barricades", which price and payment shall constitute full compensation for furnishing all plant, labor, equipment, and material necessary to furnish and install the guardrail barricades complete, including painting as specified and as shown on the drawings.

1.12 GATES. Payment for the gates specified in SECTION 02840 - GUARDRAIL BARRICADES AND GATES will be made at the contract lump sum price for "Gates", which price and payment shall constitute full compensation for all plant, labor, material, and equipment, and for performing all operations necessary for furnishing and installing the gates, complete as shown on the drawings and as specified.

1.13 ESTABLISHMENT OF TURF. Payment for establishment of turf will be made at the contract lump sum price for "Establishment of Turf", which price and payment shall constitute full compensation for furnishing all work specified in the applicable parts of SECTION 02900 - PLANTINGS.

1.14 MECHANICALLY STABILIZED EARTH WALL. Payment for the mechanically stabilized earth wall will be made at the contract lump sum price for "Mechanically Stabilized Earth Wall", which price and payment shall constitute full compensation for furnishing all work specified in SECTIONS 02223 and 02245 and all other applicable parts of DIVISION 2 – SITEWORK and DIVISION 3 - CONCRETE.

1.15 PLANTINGS. Payment for tree planting will be made at the contract lump sum price for "Plantings", which price and payment shall constitute full compensation for furnishing all work specified in the applicable parts of SECTION 02900 - PLANTINGS.

1.14 RETAINING WALL AT DIDION FOUNDRY. Payment for the retaining wall will be made at the contract lump sum price for "Retaining Wall At Didion Foundry", which price and payment shall constitute full compensation for providing all materials and work specified in SECTIONS 02411 – STEEL SHEET PILING, SECTION 03301 – CAST-IN-PLACE STRUCTURAL CONCRETE and all other applicable parts of DIVISION 2 – SITEWORK, DIVISION – 3 CONCRETE and DIVISION 5 - METALS.

1.15 CONCRETE CHANNEL LINING. Payment for the concrete channel lining will be made at the contract lump sum price for “Concrete Channel Lining”, which price and payment shall constitute full compensation for providing all applicable materials and work specified in DIVISION 3 – CONCRETE, SECTION 02270 – STONE PROTECTION, and as shown on the drawings.

1.16 CHAIN-LINK FENCE. Payment for the chain link fence will be made at the contract lump sum price for “Chain-Link Fence”, which price and payment shall constitute full compensation for providing all materials and work specified in SECTION 02831 – CHAIN-LINK FENCE, and as shown on the drawings.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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DIVISION 1 - GENERAL REQUIREMENTS

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# SECTION 01300 - SUBMITTAL PROCEDURES

## PART 1 GENERAL

1.1 SUBMITTAL CLASSIFICATION. Submittals are classified as follows:

1.1.1 Government Approved (GA). Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.1.2 For Information Only (FIO). All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. These submittals shall be filed and maintained in the Contractor’s field office subject to Government spot check.

1.2 APPROVED SUBMITTALS. The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error that may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After the Contracting Officer has approved submittals, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.3 DISAPPROVED SUBMITTALS. The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be furnished promptly to the Contracting Officer.

1.4 WITHHOLDING OF PAYMENT. Payment for materials incorporated in the work will not be made if required approvals have not been obtained. In addition; the Government will withhold 2% of the total bid price of the applicable item for which FIO technical submittals are not being maintained and on file at the Contractor’s Field Office.

## PART 2 PRODUCTS (Not Applicable)

## PART 3 EXECUTION

3.1 GENERAL. The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to the submission of submittals for both the Government Approval (GA) and For

Information Only (FIO), all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288-R). At the end of this section is one set of ENG Form 4288-R listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Accident Prevention Program (00800-14), Statement of Required Insurance (00800-19), Environmental Protection Plan (01130-1.5), Zero Base Schedule Approvable Submission (01310-3.1.3), and Quality Control Plan (01440-3.2), shall be submitted as set forth in each applicable specification paragraph and should not be included as part of the Submittal Register ENG Form 4288-R. The Government has completed columns “d“ through ”r”; the Contractor shall complete columns "a" through “c” and "s" through "u" and submit the forms to the Contracting Officer for approval within 10 calendar days after Notice to Proceed. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated. The time for submission, procurement, lag/lead and delivery shall be entered through the Resident Management System (RMS) QC module. After entry of that data, the ENG Form 4288-R (RMS) shall be produced from the RMS QC module.

3.3 SCHEDULING. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. It is the Contractor’s responsibility to provide the Corps with timely, accurate, and complete submittal packages. The Corps, in turn, will process, review, and provide official responses to the Contractor within 30 calendar days after physical receipt of the submittal, unless otherwise noted in the Technical Provisions. The Contractor shall incorporate the stated Government review time in the submittal register. No delay damages or time extensions will be allowed for time lost in late submittals. The Contractor's Quality Control representative shall review the listing at least every 60 days and take appropriate action to maintain an effective system. Copies of updated or corrected listing shall be submitted to the Contracting Officer at least every 30 days in the quantity specified.

3.4 TRANSMITTAL FORM (ENG FORM 4025-R). The sample transmittal form (ENG Form 4025-R), attached to this section, shall be used for submitting Government Approved submittals in accordance with the instructions on the reverse side of the form. This form should also be used to document the Contractor Quality Control review, and approval of, For Information Only submittals prior to filing and maintaining in the field office. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data

submitted for each item. The ENG Form 4025-R may be prepared by use of the Resident Management System (RMS) QC module.

3.5 SUBMITTAL PROCEDURE. Submittals shall be made as follows:

3.5.1 Procedures. The Contractor shall submit to the Contracting Officer for approval six copies of all shop drawings as called for under the various headings of these specifications.

3.5.2 Deviations. For submittals, which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025-R shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS. The Contractor shall carefully control its procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS. Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. The Contracting Officer will retain five copies of the submittal and one copy of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS. Approval of the Contracting Officer is not required on information only submittals. The Contractor shall maintain in his field office all current FIO submittals for use by CQC Manager during the course of the contract. The Government will periodically spot-check the Contractor’s compliance with maintaining current and correct FIO submittals for CQC purposes. Any incorrect submittals found during the Government spot check will be immediately corrected by the CQC Manager. If the Contractor fails to keep the FIO submittals current and correct, 2% of the total bid price against the applicable bid item will be withheld. At the completion of the contract, the Contractor will submit the entire file of FIO submittals to the Government.

3.9 STAMPS. Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

| CONTRACTOR (Firm Name) |
|---|
| _____ Approved |
| _____ Approved with corrections as noted on submittal data and/or attached sheets(s). |
| SIGNATURE: _____ |
| TITLE: _____ |
| DATE: _____ |

3.10 SUBMITTALS REQUIRED WITHIN 15 DAYS AFTER RECEIPT OF NOTICE OF AWARD.

| Specification Section/Para No. | Description of Submittal |
|---|---|
| 00800-18 | ACCIDENT PREVENTION PROGRAM |
| 00800-24 | STATEMENT OF REQUIRED INSURANCE |
| 01130-1.5 | ENVIRONMENTAL PROTECTION PLAN |
| 01440-3.2 | QUALITY CONTROL PLAN |

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(15-99)

SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

City of St. Peters Flood Protection Item III A - Levee

CONTRACTOR

SPECIFICATION SECTI

| | | | | | TYPE OF SUBMITTAL | | | | | | | | | | CLASSI-FICATION | | | CONTRACTOR SCHEDULE DATES | | | CONTRACTOR ACTION | | | GOVERNMENT ACTION | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACTIVITY NO<br>a. | TRANS-MITTAL NO.<br>b. | ITEM NO<br>c. | SPECIFICATION PARAGRAPH NUMBER<br>d. | DESCRIPTION OF ITEM SUBMITTED<br>e. | DATA<br>f. | DRAWINGS<br>g. | INSTRUCTIONS<br>h. | SCHEDULES<br>i. | STATEMENTS<br>j. | REPORTS<br>k. | CERTIFICATES<br>l. | SAMPLES<br>m. | RECORDS<br>n. | O&M MANUALS<br>o. | INFORMATION ONLY<br>p. | GOVERNMENT APPROVED<br>q. | REVIEWER<br>r. | SUBMIT<br>s. | APPROVAL NEEDED BY<br>t. | MATERIAL NEEDED BY<br>u. | CODE<br>v. | DATE<br>w. | SUBMIT TO GOVERN-MENT<br>x. | CODE<br>y. | DATE<br>z. |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 02110-1.3.1 | Private Property Disposal | | | | | x | | | | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 02220-1.3.1 | Right-of-Way for Drainage | | | | | | | x | | | | x | | | | | | | | | | |
| | | | 02220-1.3.2 | Earthwork Plan | | | | | x | | | | | | x | | | | | | | | | | |
| | | | 02220-1.3.3 | Pre-Pile Driving Survey Plan | | | | | x | | | | | | | x | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 02245-1.4.2.1 | Mechanically Stabilized Walls | x | | | | | | | | | | | x | | | | | | | | | |
| | | | 02245-1.4.2.2 | Masonry Block Units | x | | | | | | | | | | | x | | | | | | | | | |
| | | | 02245-1.4.2.3 | Soil Reinforcement | x | | | | | | | | | | | x | | | | | | | | | |
| | | | 02245-1.4.2.4 | Joint Filler and Cover | x | | | | | | | | | | | x | | | | | | | | | |
| | | | 02245-1.4.3.1 | Mechanically Stabilized Walls | | x | | | | | | | | | | x | | | | | | | | | |
| | | | 02245-1.4.3.2 | Concrete Leveling Footings | | x | | | | | | | | | | x | | | | | | | | | |
| | | | 02245-1.4.4 | Stabilized Walls and Access. | | | | | | x | | | | | x | | | | | | | | | | |
| | | | 02245-1.4.5 | Stabilized Walls and Access. | | | | | | | x | | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 02270-1.3.1 | Stone Source | | | | | x | | | | | | | x | | | | | | | | | |
| | | | 02270-1.3.2 | GradationTest Data | | | | | | x | | | | | | x | | | | | | | | | |
| | | | 02270-1.3.3 | Certified Weight Tickets | | | | | | | x | | | | x | | | | | | | | | | |
| | | | 02270-1.3.4 | Method of Placement | | | | | x | | | | | | | x | | | | | | | | | |
| | | | 02411-1.2.1 | Sheet Piling | | x | | | | | | | | | | x | | | | | | | | | |
| | | | 02411-1.2.2 | Pile Driving Equipment | | | | x | | | | | | | | x | | | | | | | | | |
| | | | 02411-1.2.3 | Pulling and Redriving | | | | | x | | | | | | | x | | | | | | | | | |

SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

City of St. Peters Folld Protection Item III A - Levee

CONTRACTOR

SPECIFICATION SECTI

| | | | | | TYPE OF SUBMITTAL | | | | | | | | | | CLASSI-FICATION | | | CONTRACTOR SCHEDULE DATES | | | CONTRACTOR ACTION | | | GOVERNMENT ACTION | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACTIVITY NO | TRANS-MITTAL NO. | ITEM NO | SPECIFICATION PARAGRAPH NUMBER | DESCRIPTION OF ITEM SUBMITTED | DATA | DRAWINGS | INSTRUCTIONS | SCHEDULES | STATEMENTS | REPORTS | CERTIFICATES | SAMPLES | RECORDS | O&M MANUALS | INFORMATION ONLY | GOVERNMENT APPROVED | REVIEWER | SUBMIT | APPROVAL NEEDED BY | MATERIAL NEEDED BY | CODE | DATE | SUBMIT TO GOVERN-MENT | CODE | DATE |
| a. | b. | c. | d. | e. | f. | g. | h. | i. | j. | k. | l. | m. | n. | o. | p. | q. | r. | s. | t. | u. | v. | w. | x. | y. | z. |
| | | | 02411-1.2.4.1 | Tension Test | | | | | | x | | | | | | x | | | | | | | | | |
| | | | 02411-1.2.4.2 | Materials Tests | | | | | | x | | | | | | x | | | | | | | | | |
| | | | 02411-1.2.5 | Driving Records | | | | | | | | | x | | | x | | | | | | | | | |
| | | | 02612-1.4.1 | Corrugated Steel Pipe | x | | | | | | | | | | x | | | | | | | | | | |
| | | | 02831-1.2.1 | Chain-Link Fence | | x | | | | | | | | | | x | | | | | | | | | |
| | | | 02840-1.4.1 | Guardrail | x | | | | | | | | | | x | | | | | | | | | | |
| | | | 02840-1.4.2 | Gates | | x | | | | | | | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 02900-1.3.1 | Soil Test Results | | | | | | x | | | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 03101-1.3.1 | Materials | x | | | | | | | | | | | x | | | | | | | | | |
| | | | 03101-1.3.2 | Formwork | | x | | | | | | | | | x | | | | | | | | | | |
| | | | 03101-1.3.3 | Forms and Embedded Items | | | | | | x | | | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 03150-1.2.1 | Joint Filler Strips | | | | | | x | | | | | | x | | | | | | | | | |
| | | | 03150-1.2.2 | Sealants and Primer | | | | | | | | x | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 03210-1.2.1 | Fabrication and Placement | | x | | | | | | | | | | x | | | | | | | | | |
| | | | 03210-1.2.2 | Materials | | | | | | x | | | | | x | | | | | | | | | | |
| | | | 03210-1.2.3 | Materials | | | | | | | | | x | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 03301-1.6.1.1 | Concrete Mix Proportions | | | | | x | | | | | | | x | | | | | | | | | |
| | | | 03301-1.6.1.2 | Testing Technicians | | | | | x | | | | | | x | | | | | | | | | | |

SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

City of St. Peters Folld Protection Item III A - Levee

CONTRACTOR

SPECIFICATION SECTI

| | | | | | TYPE OF SUBMITTAL | | | | | | | | | | CLASSI-FICATION | | | CONTRACTOR SCHEDULE DATES | | | CONTRACTOR ACTION | | | GOVERNMENT ACTION | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACTIVITY NO<br>a. | TRANS-MITTAL NO.<br>b. | ITEM NO<br>c. | SPECIFICATION PARAGRAPH NUMBER<br>d. | DESCRIPTION OF ITEM SUBMITTED<br>e. | DATA<br>f. | DRAWINGS<br>g. | INSTRUCTIONS<br>h. | SCHEDULES<br>i. | STATEMENTS<br>j. | REPORTS<br>k. | CERTIFICATES<br>l. | SAMPLES<br>m. | RECORDS<br>n. | O&M MANUALS<br>o. | INFORMATION ONLY<br>p. | GOVERNMENT APPROVED<br>q. | REVIEWER<br>r. | SUBMIT<br>s. | APPROVAL NEEDED BY<br>t. | MATERIAL NEEDED BY<br>u. | CODE<br>v. | DATE<br>w. | SUBMIT TO GOVERN-MENT<br>x. | CODE<br>y. | DATE<br>z. |
| | | | 03301-1.6.2.1 | Cement | | | | | | x | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.2.2 | Non-Shrink Grout | | | | | | x | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.2.3 | Air-Entraining Admixture | | | | | | x | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.2.4 | Curing Compound | | | | | | x | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.2.5 | Aggregate | | | | | | x | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.3.1 | Batch Plant | x | | | | | | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.3.2 | Mixers | x | | | | | | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.3.3 | Conveying Equipment | x | | | | | | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.3.4 | Placing | x | | | | | | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.3.5 | Joint Cleanup | x | | | | | | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.3.6 | Curing | x | | | | | | | | | | x | | | | | | | | | | | |
| | | | 03301-1.6.4.1 | Cold Weather Requirements | | | | | x | | | | | | | x | | | | | | | | | | |
| | | | 03301-1.6.4.2 | Hot Weather Requirements | | | | | x | | | | | | | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 05055-1.2.1 | Detail Drawings | | x | | | | | | | | | | x | | | | | | | | | | |
| | | | 05055-1.2.2 | Materials List | | | | x | | | | | | | x | | | | | | | | | | | |
| | | | 05055-1.2.3.1 | Welding Procedures | | | | | x | | | | | | | x | | | | | | | | | | |
| | | | 05055-1.2.3.2 | Welding Repairs | | | | | x | | | | | | | x | | | | | | | | | | |
| | | | 05055-1.2.4 | Tests, Inspections & Verifications | | | | | | x | | | | | x | | | | | | | | | | | |
| | | | 05055-1.2.5.1 | Welder Qualifications | | | | | | | x | | | | x | | | | | | | | | | | |
| | | | 05055-1.2.5.2 | Application Qualifications | | | | | | | x | | | | | x | | | | | | | | | | |
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DIVISION 1 - GENERAL REQUIREMENTS

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# SECTION 01500 - TEMPORARY CONSTRUCTION FACILITIES

## PART 1 GENERAL

1.1 GENERAL REQUIREMENTS. As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall provide the temporary facilities specified herein. The temporary facilities shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall be removed from the site of the work.

1.1.1 No Separate Payment. Payment for materials and equipment furnished under this section will not be paid for separately, and all costs in connection therewith shall be included in other items for which payment is provided.

## PART 2 PRODUCTS

2.1 TEMPORARY FIELD OFFICE TRAILER. The temporary field office trailer shall be provided, for use by the Government, complete with any necessary electrical power to operate the trailer and all telephone service. The trailer shall be located near the site of the work at a location designated by the Contracting Officer.

2.1.1 Trailer Features. The temporary field office trailer, shall be a standard trailer approximately 12 feet wide by 36 feet long and have a minimum of 7 feet in headroom. It shall be equipped with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. The trailer shall be waterproof, be supplied with heat in season, have a minimum of two doors, electric lights, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation. Sanitary facilities shall be furnished in accordance with Section 02.B of EM 385-1-1. The windows and doors shall be screened and the doors provided with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins shall be non-removable. The windows shall be arranged to open and to be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the trailer through these panels. In warm weather, air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees below the outside temperature when the outside temperature is 95 degrees Fahrenheit, shall be furnished.

2.1.2 Equipment To Be Provided. The trailer shall be provided with two desks with chairs, five additional chairs, a drafting table, two standard office tables, two additional chairs, and one legal size file cabinet capable of being locked. A supply of approved drinking water shall be provided. The trailer shall be equipped with a refrigerator having minimum capacity of 12 cubic feet, and a microwave oven having a minimum capacity of 1.5 cubic feet and 750 watts minimum power. The trailer shall also be equipped with a copier, an answering machine, a FAX machine with separate dedicated telephone line, and two cordless telephones with a common telephone line. Both telephone lines shall be provided with St. Louis lines. The Contractor will be responsible for the cost of monthly telephone service, FAX line service and the average cost of long distance telephone calls up to $200.00 per month. The trailer shall also be equipped with a 'Pentium' computer at 266 mhz-plus; 64 MB memory; 6GB-plus hard drive; 56k modem. The computer shall be compatible with DOS 6.2 and Windows 98 and shall also be supplied with a HP Laser Jet 4

printer or better.

2.1.3 Security Provisions. Adequate outside security lighting shall be provided. The Contractor shall be responsible for the security of its own equipment. In addition, the Contractor shall notify the appropriate law enforcement agency and request them to make periodic security checks of the temporary field office trailer.

2.2 TEMPORARY PROJECT AND SAFETY SIGNS. The Contractor shall furnish and erect one temporary project sign and one safety sign at the project site at the location designated by the Contracting Officer. The signs shall conform to the requirements of U.S. Army Corps of Engineers Sign Standard Manual EP-310.1-6a, Section 16 entitled, "Construction Project Signs", Pages 16.1 through 16.4, copies of which are enclosed at the end of this section. Information will be furnished by the Contracting Officer as to the location and wording of the signs.

2.3 TEMPORARY PROJECT SAFETY FENCING. The Contractor shall furnish and erect temporary project safety fencing at the work site along all construction limits. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location.

PART 3 EXECUTION

3.1 HAUL ROADS. Whenever practical, one-way haul roads shall be used on this contract. Haul roads built and maintained for this work shall comply with the following:

a. One-way haul roads for off-the-road equipment; e.g., belly dumps, scrapers, and off-the-road trucks, shall have a minimum usable width of 25 feet. One-way haul roads for over-the-road haulage equipment only (e.g., dump trucks, etc.) may be reduced to a usable width of 15 feet. When the Contracting Officer determines that it is impractical to obtain the required width for one-way haul roads (e.g., a road on top of a levee), a usable width not less than 10 feet may be approved by the Contracting Officer, provided a positive means of traffic control is implemented. Such positive means shall be signs, signals, and/or signalman and an effective means of speed control.

b. Two-way haul roads for off-the-road haulage equipment shall have a usable width of 60 feet. Two-way haul roads for over-the-road haulage equipment only may be reduced to a usable width of 30 feet.

c. Haul roads shall be graded and otherwise maintained to keep the surface free from potholes, ruts, and similar conditions that could result in unsafe operation.

d. Grades and curves shall allow a minimum sight distance of 200 feet for one-way roads and 300 feet for two-way roads. Sight distance is defined as the centerline distance an equipment operator (4.5 feet above the road surface) can see an object 4.5 feet above the road surface. When conditions make it impractical to obtain the required sight distance (e.g., ramps over levees), a positive means of traffic control shall be implemented.

e. Dust abatement shall permit observation of objects on the roadway at a minimum distance of 300 feet.

f. Haul roads shall have the edges of the usable portion marked

with posts at intervals of 50 feet on curves and 200 feet maximum elsewhere. Such markers shall extend 6 feet above the road surface and, for nighttime haulage, be provided with reflectors in both directions.

3.2 CLEANUP. Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away.

3.3 RESTORATION OF STORAGE AREA. Upon completion of the project, areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition.

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# SECTION 02111
# REMOVALS AND DEBRIS CLEARING

## PART 1 - GENERAL

1.1 SCOPE. The work covered by this section consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for the removals and debris clearing of the area specified herein and the disposal of such materials.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control and maintain records of quality control for all construction operations including but not limited to the following:

(1) Removals. Limits, percentage of area complete; type of material.

(2) Debris Clearing. Limits, percentage of area complete; type of material.

(3) Disposition of Removals and Debris Clearing. Method and location of disposition; damage to timber or improvements not to be cleared.

1.2.2 Reporting. A copy of these records of inspections and tests, as well as the records of corrective action taken, shall be furnished to the Government daily.

## PART 2 - PRODUCTS (NOT APPLICABLE)

## PART 3 - EXECUTION

3.1 REMOVALS. The Contractor shall remove all items from within the construction limits shown on the drawings. Removals shall also include road surfacing and crushed stone base course, significant rubble in creek, fences, concrete and bituminous pavement, riprap, headwalls, culvert pipes, farm bridge abutment, and similar items not labeled on the drawings. Removal from the site shall be in accordance with paragraph 3.4.2 of SECTION 02110. Areas of removal outside the slope limits of construction shall be restored as required to provide adequate drainage and seeded in accordance with the applicable parts of SECTION 02900 - PLANTINGS.

3.2 DEBRIS CLEARING. The Contractor shall remove discarded man-made objects consisting of, but not limited to, glass, plastic, wood, cloth, paper, concrete, metal, brick, rubber, etc. within the construction limits shown on the drawings. Removal from the site shall be in accordance with paragraph 3.4.2 in SECTION 02110.

3.3 The chain link fence within the ROW limits shall be removed by the Contractor and turned over to the City of St. Peters. The fabric shall be neatly rolled and extra care shall be taken in post removal to keep from bending posts.

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# SECTION 02220
# EXCAVATION

## PART 1 - GENERAL

1.1 SCOPE. The work covered by this section consists of furnishing all plant, labor, materials, and equipment, and performing all operations necessary for excavation in borrow areas, excavation stream channels, removal of unsuitable material from embankment foundations, excavation for structures described in paragraph 3.2.2, and all other excavation incidental to the construction of embankments, and channel improvements as specified herein or as shown on the drawings.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control for excavation operations to assure compliance with contract requirements, and maintain records of quality control for all construction operations including but not limited to the following:

(1) Borrow Area. Location, limits, allowable depths, drainage.

(2) Other Areas. Side slopes, dimensions, and grades.

(3) Disposition of Materials. Suitability of materials and disposal areas.

1.2.2 Reporting. A copy of these records and tests, as well as the records of corrective action taken, shall be furnished the Government daily.

1.3 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having and "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.3.1 Certificate; FIO. Contractor-furnished Rights-of-way for Drainage. If the Contractor proposes to provide drainage on private property, the Contractor shall submit written evidence to the Contracting Officer that permission has been obtained from the property owner for drainage on the owner's property. The written evidence shall consist of an authenticated copy of the conveyance under which the Contractor acquired the property rights and access thereto, prepared and executed in accordance with the laws of the State of Missouri.

1.3.2 Statement; FIO. Earthwork Plan. The Contractor shall submit 30 days prior to initiating any excavation, the plan of operations for performing all excavation and backfill specified herein. This plan shall include, but not be limited to, the Contractor's proposed sequence of construction for all excavation, backfill and embankment items; methods and types of equipment to be utilized for all excavation and backfill operations, including excavating, transporting, placing and compacting; quantity, type and final disposition of stockpiled materials; location and drainage of proposed stockpiles; proposed disposition of all excavated materials, including items which are anticipated to be disposed of off-site. This plan shall also name the commercial testing lab or engineering firms that will perform the soil testing and inspection and describe how all required soils testing will be performed.

1.3.3 Statement. Pre-pile driving survey plan; GA.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXCAVATION IN BORROW AREA.

3.1.1 General. The rights-of-way and earth materials for constructing the work will be furnished without cost to the Contractor, at locations specified herein and/or shown on the drawings. Pervious materials shall be Contractor-furnished. Borrow, if required, shall be excavated as specified below.

3.1.1.1 Equipment. The Contractor shall provide the types of equipment as necessary to perform the required excavation according to the in situ conditions of the borrow area.

3.1.2 Borrow Area.

3.1.2.1 Borrow area shall conform to requirements prescribed herein and as shown on the drawings. All borrow shall be obtained from Government-furnished borrow area which will become the future impoundment area. The permissible depths in the borrow area are indicated on the drawings. Abrupt changes in grade shall be avoided. Any excavation below the depths and slopes specified herein or shown on the drawings shall be backfilled by the Contractor, at no additional cost to the Government, to the specified permissible excavation line, with suitable uncompacted fill plus 25 percent additional material for shrinkage. The borrow area excavated under this contract shall be drained and kept dry during excavation, as excavation will not be permitted in water nor shall excavated material be scraped, dragged or otherwise moved through water. Drainage of borrow area shall be accomplished by ditching, sump pumping or other approved methods. The borrow area excavated under this contract and flooded from rains or high river stages shall be drained and allowed to dry as quickly as practicable after the high river stage has passed. Rights-of-way for drainage will be furnished by the Government at the locations shown on the drawings. The Contractor, at its option, may use rights-of-way for drainage other than those furnished by the Government provided that their location and dimensions are approved by the Contracting Officer, and provided that the Contractor has submitted written evidence to the Contracting Officer that permission has been obtained from the property owners as required by paragraph 1.3.1. The Contractor shall be solely responsible for any and all damages, claims for damages, and liability of any nature whatsoever arising from or growing out of the use of rights-of-way for drainage other than those rights-of-way furnished by the Government. The excavation of the borrow area shall be made continuous throughout the length of the borrow area to the permissible borrow depths, and at the width necessary to provide the required quantity of suitable material, and in such manner that all suitable available material within the required width will be utilized. As required by paragraph 1.3.2, the Contractor shall submit an earthwork plan that contains, as a minimum, the following:

(1) The Contractor's proposed methods for draining, and keeping dry during excavation the borrow area excavated under this contract.

(2) The Contractor's proposed methods for draining borrow area excavated under this contract which may be flooded by rains or high river stages.

(3) A statement indicating whether the Contractor proposes to use:

(a) Government-furnished rights-of-way for drainage;

(b) Contractor-furnished rights-of-way for drainage; or

(c) A combination of Government-furnished and Contractor-furnished rights-of-way for drainage.

(4) For Contractor-furnished rights-of-way for drainage, the plan shall contain all of the information required by paragraph 3.1.2.1 and the Contractor's proposals for implementing SECTION 01130 - ENVIRONMENTAL PROTECTION, insofar as that applies to rights-of-way for drainage.

(5) The Contractor's proposed methods for smoothing the bottom of the borrow area after having completed use of the area.

3.1.3 Disposition of Materials.

3.1.3.1 Suitable Materials. Excavated materials which are suitable for incorporation in the embankment, or other fills shall either be placed directly therein, or stockpiled and subsequently used in the embankment or other fills. Excess suitable material shall be disposed as unsuitable.

3.1.3.2 Unsuitable Materials. Materials from required excavation which, as defined in SECTION 02221 - EMBANKMENT, are unsuitable for embankment or fill material will be ordered wasted and shall be disposed of in the areas shown on the drawings. Unsuitable material will be disposed of in the existing impoundment area first, and continue until the entire area is filled to the elevations shown on the drawings. All water in the disposal area shall be removed prior to placement of disposal. The surface of the material shall be free from abrupt changes in grade and shall be sloped to drain.

3.1.3.3 Stockpiles. When necessary the Contractor shall stockpile suitable excavated materials. Stockpiles shall not exceed 15 feet in height and slopes shall not be steeper than 1V on 2H. The toe of the stockpiled material shall be at least 50 feet from top of any excavated slope or the natural bank of any ditch or stream.

3.2 EXCAVATION IN OTHER AREAS.

3.2.1 General. Excavation from other areas shall consist of removal of material in preparing the embankment foundations to the lines and grades shown on the drawings, and removal of unsuitable materials as defined in SECTION 02221. Whenever unsuitable foundation material is encountered, the unsuitable material shall be removed to the depth directed by the Contracting Officer. The Contractor shall exercise care in excavating to the lines and grades shown and in removing unsuitable materials so as not to excavate below the grades specified or depth directed. Excavation below the lines and grades specified or the depth directed shall be backfilled by the Contractor at no additional cost to the Government. Such backfill shall be brought to grade with suitable material with each layer placed and compacted as specified in SECTION 02221. Temporary excavated earth slopes shall not be steeper than the slopes shown on the drawings unless the excavation is shored. All excavation shall be done when no standing water is present. Flow in Spencer Creek shall be diverted from the area being constructed, which are below the water surface. The Contractor shall be responsible for maintaining a 4-feet high level of protection for the work area. Disposition of excavated materials shall be as

specified in paragraph 3.1.3.

3.2.2 Structures.

3.2.2.1 Excavation shall be performed as necessary to permit construction of the structures and work incidental thereto, to the lines, dimensions, and elevations shown on the drawings. Excavation shall extend a sufficient distance from walls and footings to allow for placement and removal of shoring and forms (except where the concrete for walls and footings is authorized to be deposited directly against excavated surfaces), performance of all work in the excavations, and inspection.

3.2.2.2 After completion of excavation, and prior to construction of the structures, the Contracting Officer will inspect the excavation to ensure that suitable foundations or depths have been established. The Contractor shall not excavate below the depths indicated on the drawings unless otherwise specified or directed by the Contracting Officer. Where the excavation is made below the prescribed elevation, the excavation shall be restored to the proper elevation with densified impervious material or the depths of the walls or footings shall be increased as directed by the Contracting Officer. Where excavation is made below the prescribed depths through the fault of the Contractor, the additional backfill or concrete required shall be at no additional expense to the Government.

# SECTION 02270
# STONE PROTECTION

## PART 1 - GENERAL

1.1 SCOPE. The work provided for herein consists of furnishing all plant, labor, equipment and materials, and performing all operations in connection with the construction of the stone protection, including foundation preparation, bedding layer for the slopes and bottom of the channel, and elsewhere as shown on the contract drawings, in accordance with these specifications and the contract drawings.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control for all stone protection operations to ensure compliance with contract requirements, and shall maintain records of the quality control for all construction operations, including but not limited to the following:

(1) Foundation preparation (line and grade).

(2) Inspection at the worksite to ensure use of specified materials.

(3) Bedding layer gradation and placement.

(4) Riprap gradation and placement.

(5) 6-inch minus gradation and placement.

1.2.2 Reporting. A copy of the records of inspection and tests, as well as the records of corrective action taken, shall be furnished to the Government daily.

1.3 SUBMITTALS. Government approval is required for submittals with a GA designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

1.3.1 Source of Stone. GA. A list of all stone source or sources shall be submitted at least 30 days prior to any placement of stone protection.

1.3.2 Gradation Test Data. GA. The results of all gradations shall be submitted within 24 hrs. after completion of the test.

1.3.3 Certified Weight Tickets. FIO.

1.3.4 Method of Placement. GA. A detailed description of the method for placing the bedding, riprap and aggregate drain material shall be submitted at least 30 days prior to any placement of material.

1.4 APPICABLE PUBLICATION.

1.4.1 American Society for Testing and Materials (ASTM).

C 127-88(R 1993) Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate

C 136-95a Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

PART 2 - PRODUCTS

2.1 STONE.

2.1.1 General. All stone shall be durable material as approved by the Contracting Officer. The sources from which the Contractor proposes to obtain the materials shall be selected well in advance of the time when the material will be required. Stone for riprap shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, seams, and other defects that would tend unduly to increase its deterioration from natural causes. The inclusion of objectionable quantities of dirt, sand, clay, and rock fines will not be permitted.

2.1.2 Sources and Evaluation Testing. All stone shall be obtained in accordance with the provisions in paragraph 40, STONE SOURCES of the Special Clauses. If the Contractor proposes to furnish stone from a source not listed in paragraph 40, the Contractor shall make such investigations as necessary to determine whether acceptable stone can be produced from the proposed source. Satisfactory service records on work outside the Corps of Engineers will be acceptable. If no such records are available, the Contractor shall make tests to ensure the acceptability of the stone. The tests to which the stone may be subjected will include petrographic analysis, specific gravity, abrasion, absorption, wetting and drying, freezing and thawing, and such other tests as may be considered necessary by the Contracting Officer. The following guidance is provided for use by the Contractor in analyzing a new source of stone. Stone that either weighs less than 155 pounds per cubic foot or has more than 2 percent absorption will not be accepted unless other tests and service records show that the stone is satisfactory. The method of tests for unit weight and absorption will be ASTM C 127-88, (R 1993) entitled Specific Gravity and Absorption of Coarse Aggregate." Samples of stone shall be taken by the Contractor under the supervision of the Contracting Officer at least 60 days in advance of the time the placing of the stone is expected to begin. The tests shall be conducted by the Contractor in accordance with applicable Corps of Engineers methods of test given in the Handbook of Concrete and Cement, and shall be performed at an approved testing laboratory. The cost of testing shall be borne by the Contractor.

2.1.3 Gradation Test. The Contractor shall perform at least one gradation test on the bedding and 6 inch minus material prior to delivery to the job site and one additional gradation test for every 5000 tons delivered. The Contractor shall perform a gradation test on riprap at the quarry in accordance with " LMVD Standard Test Method for Gradation of Riprap", a copy of which is attached at the end of this section. At least one gradation test shall be performed prior to delivery of the riprap material to the job site and one additional gradation test for every 10000 tons delivered. The sample shall be taken by the Contractor under the supervision of the Contracting Officer, shall consist of not less than 15 tons of riprap and shall be collected in a random manner, which will provide a sample, which accurately reflects the actual gradation arriving at the job site. If collected by the truckload, each truckload shall be representative of the gradation requirements. The Contractor shall provide all necessary screens, scales and other equipment, and the operating personnel therefor, and shall grade the sample, all at no additional cost to the Government. The contractor shall

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SECTION 02411
STEEL SHEET PILING

1 GENERAL

1.1 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1.1.1 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM A 6-98 | General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling |
| ASTM A 328-98 | Steel Sheet Piling |

1.2 SUBMITTALS. Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1.2.1 Drawings. Steel Sheet Piling; GA. Detail drawings for sheet piling including fabricated sections shall show complete piling dimensions and details, splicing details, driving sequence and location of installed piling. Detail drawings shall include details and dimensions of templates and other temporary guide structures for installing piling. Detail drawings shall provide details of the method of handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

1.2.2 Schedules. Pile Driving Equipment; GA. Complete descriptions of sheet piling driving equipment including hammers, extractors, protection caps and other installation appurtenances shall be submitted for approval prior to commencement of work.

1.2.3 Statements. Pulling and Redriving; GA. The proposed method of pulling sheet piling shall be submitted and approved prior to pulling any piling.

1.2.4 Reports.

1.2.4.1 Interlocked Joint Strength in Tension Test ; GA. The procedure for testing sheet piling interlocked joint strength in tension shall be submitted and approved prior to testing piling.

1.2.4.2 Materials Tests; GA. Certified materials tests reports showing that sheet piling and appurtenant metal materials meet the specified requirements shall be submitted for each shipment and identified with specific lots prior to installing materials. Material test reports shall meet the requirements of ASTM A 6.

1.2.5 Records. Driving Records; GA. Records of the sheet piling driving operations shall be submitted after driving is completed. These records shall provide a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling

penetration rate data, piling dimensions and top and bottom elevations of installed piling.

1.3 DELIVERY, STORAGE AND HANDLING. Materials delivered to the site shall be undamaged new and/or reconditioned and shall be accompanied by certified test reports. The manufacturer's logo and mill identification mark shall be provided on the sheet piling as required by the referenced specifications. Sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Storage of sheet piling should also facilitate required inspection activities.

2 PRODUCTS

2.1 STEEL SHEET PILING. Steel sheet piling shall be hot-rolled steel sections conforming to ASTM A 328. The interlocks of sheet piling shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed. Sheet piling, including special fabricated sections, shall be full-length sections of the dimensions shown on the drawings. Fabricated sections shall conform to the requirement and the piling manufacturer's recommendations for fabricated sections. Sheet piling shall be provided with standard pulling holes. Metalwork fabrication for sheet piling shall be as specified and in Section 05055 METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS.

SHEET PILING SECTION PROPERTIES

| Type of Section | Nominal Width (In.) | Nominal Web Thickness (In.) | Min. Section Modulus Per Lin. Ft. of Wall $(In.)^3$ | Weight Per Sq.Ft. of Wall (Lbs.) | Weight Per Lin.Ft. of Bar (Lbs.) |
|---|---|---|---|---|---|
| PZ 35 | 22.64 | 0.50 | 48.5 | 35.0 | 66.0 |

2.2 APPURTENANT METAL MATERIALS. Metal plates, shapes, bolts, nuts, rivets and other appurtenant fabrication and installation materials shall conform to manufacturer's standards and to the requirements specified in the respective sheet piling standards and in Section 05502 MISCELLANEOUS METAL MATERIALS, STANDARD ARTICLES, AND SHOP FABRICATED ITEMS.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS. Requirements for material tests, workmanship and other measures for quality assurance shall be as specified and in Section 05055 METALWORK FABRICATION, MACHINE WORK, AND MISCELLANEOUS PROVISIONS.

2.3.1 Materials Tests. Materials tests shall conform to the following requirements. Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations. Testing of sheet piling shall meet the requirements of ASTM A 6.

## 3 EXECUTION

### 3.1 INSTALLATION

3.1.1 Pile Driving Equipment. Hammers shall be steam, air, or diesel drop, single-acting, double-acting, differential-acting type. The pile driving hammers shall be sized appropriately as recommended by the manufacturer for the piling weights and subsurface materials to be encountered.

3.1.2 Placing and Driving

3.1.2.1 Placing. Any excavation required within the area where sheet pilings are to be installed shall be completed prior to placing sheet pilings. Pilings shall be carefully located as shown on the contract drawings. Pilings shall be placed plumb with out-of- plumbness not exceeding 1/8 inch per foot of length and true to line. Temporary wales, templates, or guide structures shall be provided to insure that the pilings are placed and driven to the correct alignment. At least two templates shall be used in placing each piling and the maximum spacing of templates shall not exceed 20 feet. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.

3.1.2.2 Driving. Pilings shall be driven with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths. Driving hammers shall be maintained in proper alignment during driving operations by use of leads or guides attached to the hammer. A protecting cap shall be employed in driving when using impact hammers to prevent damage to the tops of pilings. Pilings damaged during driving or driven out of interlock shall be removed and replaced at the Contractor's expense. Pilings shall be driven without the aid of a water jet. Adequate precautions shall be taken to insure that pilings are driven plumb. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall the piling being driven shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling. If obstructions restrict driving a piling to the specified penetration the obstructions shall be removed or penetrated with a chisel beam. If the Contractor demonstrates that removal or penetration is impractical the Contractor shall make changes in the design alignment of the piling structure as directed to insure the adequacy and stability of the structure. Pilings shall be driven to depths shown on the contract drawings and shall extend up to the elevation indicated for the top of pilings. Pilings shall not be driven within 100 feet of concrete less than 7 days old.

3.1.3 Cutting-Off and Splicing. Pilings driven to refusal or to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Pilings driven below the required top elevation

and pilings damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed at no additional cost to the Government. If directed pilings shall be spliced as required to drive them to depths greater than shown and extend them up to the required top elevation. If splices are required in adjoining pilings the splices must be spaced at least 5 feet apart in elevation and shall be accomplished within the lower fifteen (15) feet of the piling. All splices shall be designed to develop the full shear and moment capacity of the section and shall be in accordance with the manufacturer’s recommendation and submitted for Government review and approval prior to installation. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. The tops of pilings excessively battered during driving shall be trimmed when directed at no cost to the Government. Piling cut-offs shall become the property of the Contractor and shall be removed from the site. The Contractor shall cut holes in pilings for bolts, rods, drains or utilities as shown or as directed. All cutting shall be done in a neat and workmanlike manner. A straight edge shall be used in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal. Holes other than bolt holes shall be reasonably smooth and the proper size for rods and other items to be inserted.

3.1.4 Inspection of Driven Piling. The Contractor shall inspect the interlocked joints of driven pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense.

SECTION 02900
PLANTINGS

PART 1 - GENERAL

1.1 SCOPE.

1.1.1 The work covered by this section of the specifications consists of furnishing all materials, equipment, plant and labor, and performing all work required for seeding, planting, mulching, liming, and fertilizing in accordance with the requirements of this section of the specifications.

1.1.2 Turf shall be established on all newly constructed areas except the bottom of the lower slopes (3 feet above flowline) of Spencer Creek. Additionally a cover crop shall be established in the approximately 8 acres surrounding the north and east ends of the Impoundment area as shown in the drawings. Turf shall be established in the Impoundment area. All areas disturbed by the Contractor’s operations shall be seeded or turfed at no additional cost to the Government. All areas turfed shall the General Seed Mixture except the Impoundment area shall use the special seed mix and the approximately 8 acres surrounding the north and east ends of the Impoundment area shall use the Cover Seed Mixture. Trees will be planted on the same approximately 8.0 acres as shown in the drawings. The tree composition will be a mixture of bottomland hardwood trees as specified in section 3.1.

1.1.3 When all work under this contract is completed except work required under this section, and such work is not performed because of seasonal limitations stated in paragraph 1.4, or because of conditions occurring within the specified seeding season which, in the opinion of the Contracting Officer, are unfavorable for such work, the time for completion will be extended by the number of days that work is thereby delayed.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control to assure compliance with the contract specifications and shall maintain records of quality control for all construction operations.

(1) Dressing

(2) Fertilizing

(3) Liming

(4) Mulching

(5) Seeding

(6) Tree Planting

1.2.2 Reporting. A copy of these records of inspections and tests, as well as the records of corrective action taken, shall be furnished to the Government daily.

1.3 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having a "FIO" designation are for information

only. The following shall be submitted in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.3.1 Soil Test Results. FIO. Submit soil test results and fertilizer application rates.

1.4 COMMENCEMENT, PROSECUTION, AND COMPLETION. Seeding operations for the General Seed Mixture shall be performed between 15 March and 15 May or between 15 August and 30 September. Seeding operations for the Special Seed Mixture shall be performed between 15 March and 15 May. Tree planting operation shall be accomplished during the spring (February 15 - March 30) or fall planting season (October 20 to November 15) as recommended by the nurseryman supplier to provide maximum survival rate of the dormant planting stock. Seeding operations for the Cover Crop Mixture shall be performed prior to tree planting. Seed, fertilizer, limestone and mulch shall be applied as herein specified and in accordance with standard horticultural practices for establishing new turf.

PART 2 - PRODUCTS

2.1 FERTILIZER. Fertilizer shall be uniform in composition and free-flowing. The fertilizer may be delivered to the site in bags or other convenient containers or delivered in bulk. If delivered in bags or containers, the fertilizer shall be fully labeled in accordance with the applicable fertilizer laws of the State and shall bear the name, trademark, and warranty of the producer. The fertilizer shall meet the requirements of the State for commercial fertilizer. Should the commercial fertilizer be furnished in bulk, the Contractor shall furnish certified weight tickets and a certified quantitative analysis report, in triplicate, from a recognized testing laboratory certifying the nutrient ratio of the materials. In the event the commercial mixture is delivered to the job site in the original containers, unopened, the analysis report will not be required. Quantity of fertilizer required per acre shall be determined by certified soil tests as specified in paragraph 3.1.

2.2 LIMESTONE. Limestone shall be approved agricultural grade limestone containing not less than 85 percent total carbonates. Limestone shall be ground to such fineness that 25 percent will pass a 100-mesh sieve and 100 percent will pass an 8-mesh sieve. Quantity of lime required per acre shall be determined by certified soil tests as specified in paragraph 3.1.

2.3 SEED. Seed labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act, as reprinted with amendments August 1963, shall be furnished by the Contractor. Seed shall be fresh, new crop, furnished in sealed, standard containers unless written exception is granted. Seed that is wet or moldy or that has been otherwise damaged in transit or storage will not be acceptable. The seed mixes, rates of application, minimum percent purity and germination, and maximum percent weed control shall be as shown in the following tables:

# SECTION 03101
# FORMWORK FOR CONCRETE

## PART 1 - GENERAL

1.1 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1.1.1 American Concrete Institute (ACI).

| | |
|---|---|
| ACI 347R-94 | Guide for Formwork for Concrete |

1.1.2 American Society for Testing and Materials (ASTM).

| | |
|---|---|
| ASTM C 31-98 | Making and Curing Concrete Test Specimens in the Field |
| ASTM C 39-96 | Compressive Strength of Cylindrical Concrete Specimens |
| ASTM C 1077-98 | Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation |

1.1.3 Department of Commerce (DOC).

| | |
|---|---|
| DOC PS 1-96 | Construction and Industrial Plywood |

1.2 DESIGN REQUIREMENTS. The design, engineering, and construction of the formwork shall be the responsibility of the Contractor. The formwork shall be designed for anticipated live and dead loads and shall comply with the tolerances specified in SECTION 03301 CAST-IN-PLACE STRUCTURAL CONCRETE paragraph CONSTRUCTION TOLERANCES. The formwork shall be designed as a complete system with consideration given to the effects of cementitious materials and mixture additives such as fly ash, cement type, plasticizers, accelerators, retarders, air entrainment, and others. The adequacy of formwork design and construction shall be monitored prior to and during concrete placement as part of the Contractor's approved Quality Control Plan.

1.3 SUBMITTALS. Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

1.3.1 Data. Materials; GA. Submit manufacturer's literature for plywood, concrete form hard board, form accessories, prefabricated forms, and form coating.

1.3.2 Drawings. Formwork; FIO. Submit drawings and design computations for all formwork required shall be submitted at least 45 days either before fabrication on site or before delivery of prefabricated forms. The shop drawings and data submitted shall include the type, size, quantity, and strength of all materials of which the forms are made, the plan for jointing of facing panels, details affecting the appearance, and the assumed design values and loading conditions. Design computations and drawings shall be stamped by a professional engineer registered in the State of Missouri.

1.3.3 Reports. Forms and Embedded Items; FIO. The Contractor shall submit field inspection reports for concrete forms and embedded items.

PART 2 - PRODUCTS

2.1 MATERIALS.

2.1.1 Forms and Form Liners. Forms and form liners shall be fabricated with facing materials that will produce a finish meeting the specified construction tolerance requirements and the following surface classifications as defined in ACI 347R.

2.1.1.1 Class "B" Finish. This class of finish shall apply to all surfaces except those specified to receive a Class "D" Finish. The form facing material shall be composed of tongue-and-groove or shiplap lumber, plywood conforming to DOC PS 1, Grade B-B concrete form, tempered concrete form hard board or steel. Steel lining on wood sheathing will not be permitted.

2.1.1.2 Class "D" Finish. This class of finish shall apply to all surfaces to receive backfill. The form facing may be either wood or steel.

2.1.2 Form Coating. Form coating shall be commercial formulation that will not bond with, stain, cause deterioration, or any other damage to concrete surfaces. The coating shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds. If special form liners are to be used, the Contractor shall follow the recommendation of the form coating manufacturer.

2.2 ACCESSORIES. Ties and other similar form accessories to be partially or wholly embedded in the concrete shall be of a commercially manufactured type. After the ends or end fasteners have been removed, the embedded portion of metal ties shall terminate not less than 2 inches from any concrete surface either exposed to view or exposed to water. Removable tie rods shall not be allowed. Plastic snap ties may be used in locations where the surface will not be exposed to view. Form ties shall be constructed so that the ends or end fasteners can be removed without spalling the concrete.

PART 3 - EXECUTION

3.1 INSTALLATION.

3.1.1 Form Construction. Forms shall be constructed true to the structural design and required alignment. The form surface and joints shall be mortar tight and supported to achieve safe performance during construction, concrete placement, and form removal. The Contractor shall continuously monitor the alignment and stability of the forms during all phases to assure the finished product will meet the required surface classes specified in paragraph FORMS AND FORM LINERS and tolerances specified in paragraph DESIGN REQUIREMENTS. Failure of any supporting surface either due to surface texture, deflection or form collapse shall be the responsibility of the Contractor as will the replacement or correction of unsatisfactory surfaces. When forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be re-used if there is any evidence of defects which would impair the quality of the resulting concrete surface. All surfaces of used forms shall be cleaned of mortar and any other foreign material before reuse.

3.1.2 Chamfering. All exposed joints, edges and external corners shall be chamfered by molding placed in the forms unless the drawings specifically state that chamfering is to be omitted or as otherwise specified. Chamfered joints shall not be permitted where earth or rockfill is placed in contact

# SECTION 03150
# EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS IN CONCRETE

## PART 1 - GENERAL

1.1 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1.1.1 American Society for Testing and Materials (ASTM).

| | |
|---|---|
| ASTM C 920-98 | Elastomeric Joint Sealants |
| ASTM D 1752-84 (R 1996) | Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction |
| ASTM D 2822-91 (R 1997) | Asphalt Roof Cement |

1.2 SUBMITTALS. Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

1.2.1 Reports. Premolded Expansion Joint Filler Strips; GA. Submit manufacturer's certified test reports and compliance certificates for premolded expansion joint filler strips, and sealants to verify compliance with applicable specification.

1.2.2 Samples. Sealants and Primer; FIO. Submit one gallon of field-molded sealant and one quart of primer (when primer is recommended by the sealant manufacturer) for testing.

1.3 TESTS, INSPECTIONS, AND VERIFICATIONS.

1.3.1 Materials Tests.

1.3.1.1 Field-Molded Sealants. Samples of sealant and primer, when use of primer is recommended by the manufacturer, as required in paragraph FIELD MOLDED SEALANTS AND PRIMER, may be tested by and at the expense of the Government for compliance with ASTM C 920. If the sample fails to meet specification requirements, new samples shall be provided and the cost of retesting will be paid by the Contractor at no additional cost to the Government.

## PART 2 - PRODUCTS

2.1 MATERIALS.

2.1.1 Premolded Expansion Joint Filler Strips. Premolded expansion joint filler strips shall conform to ASTM D 1752, Type I sponge rubber.

2.1.2 Joint Seals and Sealants.

2.1.2.1 Field Molded Sealants and Primer. Field molded sealants shall conform to ASTM C 920, Type M for horizontal joints and Type NS for vertical joints, Class 25, and Use NT. Bond breaker material shall be polyethylene

tape, coated paper, metal foil or similar type materials. The back-up material shall be compressible, nonshrink, nonreactive with sealant, and nonabsorptive material type such as extruded butyl or polychloroprene foam rubber.

PART 3 - EXECUTION

3.1 INSTALLATION. Joint locations and details, including materials and methods of installation of joint fillers, shall be as specified, as shown, and as directed. In no case shall any fixed metal be continuous through an expansion or contraction joint.

3.1.1 Expansion Joints. Premolded filler strips shall have oiled wood strips secured to the top thereof and shall be accurately positioned and secured against displacement to clean, smooth concrete surfaces. The wood strips shall be slightly tapered, dressed and of the size required to install filler strips at the desired level below the finished concrete surface and to form the groove for the joint sealant or seals to the size shown. Material used to secure premolded fillers and wood strips to concrete shall not harm the concrete and shall be compatible with the joint sealant or seals. The wood strips shall not be removed until after the concrete curing period. The groove shall be thoroughly cleaned of all laitance, curing compound, foreign materials, protrusions of hardened concrete and any dust that shall be blown out of the groove with oil-free compressed air.

3.1.1.1 Joints With Field-Molded Sealant. Joints shall not be sealed when the sealant, air or concrete temperature is less than 40 degrees F. Bond breaker and back-up material shall be installed where required. Joints shall be primed and filled flush with joint sealant in accordance with the manufacturer's recommendations.

3.1.2 Contraction Joints. Joints requiring a bond breaker shall be coated with bituminous material conforming to ASTM D 2822.

-- END OF SECTION 03150 --

SECTION 05055
METALWORK FABRICATION AND MISCELLANEOUS PROVISIONS

INDEX

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SECTION 05055
METALWORK FABRICATION AND MISCELLANEOUS PROVISIONS

PART 1 GENERAL

1.1 REFERENCES. THE PUBLICATIONS LISTED BELOW FORM A PART OF THIS SPECIFICATION TO THE EXTENT REFERENCED. THE PUBLICATIONS ARE REFERRED TO IN THE TEXT BY BASIC DESIGNATION ONLY.

1.1.1 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|---|---|
| ASTM A 325 | (1994) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength |

1.1.2 AMERICAN WELDING SOCIETY (AWS)

| | |
|---|---|
| AWS D1.1 | (1994) Structural Welding Code - Steel |

1.2 SUBMITTALS. GOVERNMENT APPROVAL IS REQUIRED FOR ALL SUBMITTALS WITH A "GA" DESIGNATION; SUBMITTALS HAVING AN "FIO" DESIGNATION ARE FOR INFORMATION ONLY. THE FOLLOWING SHALL BE SUBMITTED IN ACCORDANCE WITH SECTION 01330 SUBMITTAL PROCEDURES:

1.2.1 Drawings. Detail Drawings; GA. Detail drawings for metalwork shall be submitted and approved prior to fabrication.

1.2.2 Schedules. Materials List; FIO. Materials list for fabricated items shall be submitted at the time of submittal of detail drawings.

1.2.3 Statements.

1.2.3.1 Welding Procedures for Structural Steel; GA. Schedules of welding procedures for steel structures shall be submitted and approved prior to commencing fabrication.

1.2.3.2 Structural Steel Welding Repairs; GA. Welding repair plans for steel shall be submitted and approved prior to making repairs.

1.2.4 Reports. Tests, Inspections, and Verifications; FIO. Certified test reports for materials shall be submitted with all materials delivered to the site.

1.2.5 Certificates.

1.2.5.1 Qualification of Welders and Welding Operators; FIO. Certifications for welders and welding operators shall be submitted prior to commencing fabrication.

1.2.5.2 Application Qualification for Steel Studs; GA. Certified reports for the application qualification for steel studs shall be submitted and approved prior to commencing fabrication.

1.3 METALWORK DETAIL DRAWINGS. Detail drawings for metalwork shall include catalog cuts, templates, fabrication and assembly details and type, grade and class of material as appropriate. Elements of fabricated items

inadvertently omitted on contract drawings shall be detailed by the fabricator and indicated on the detail drawings.

1.4 QUALIFICATION OF WELDERS AND WELDING OPERATORS. The Contractor shall certify that the qualification of welders and welding operators and tack welders who will perform structural steel welding have been qualified for the particular type of work to be done in accordance with the requirements of AWS D1.1, Section 5, prior to commencing fabrication. The certificate shall list the qualified welders by name and shall specify the code and procedures under which qualified and the date of qualification. Prior qualification will be accepted if welders have performed satisfactory work under the code for which qualified within the preceding three months. The Contractor shall require welders to repeat the qualifying tests when their work indicates a reasonable doubt as to proficiency. Those passing the requalification tests will be recertified. Those not passing will be disqualified until passing. All expenses in connection with qualification and requalification shall be borne by the Contractor.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Materials Orders. The Contractor shall furnish 2 copies of purchase orders, mill orders, shop orders and work orders for all materials orders and items used in the work. Where mill tests are required purchase orders shall contain the test site address and the name of the testing agency.

2.1.2 Materials List. The Contractor shall furnish a materials list of the materials to be used in the fabrication of each item.

2.1.3 Shipping Bill. The Contractor shall furnish a shipping bill or memorandum of each shipment of finished pieces or members to the project site giving the designation mark and weight of each item, the number of items, the total weight, and the car initial and number if shipped by rail in carload lots.

2.2 FABRICATION

2.2.1 Structural Fabrication. Material must be straight before being laid off or worked. If straightening is necessary it shall be done by methods that will not impair the metal. Sharp kinks or bends shall be cause for rejection of the material. Material with welds will not be accepted except where welding is definitely specified, indicated or otherwise approved. Bends shall be made by approved dies, press brakes or bending rolls. Where heating is required, precautions shall be taken to avoid overheating the metal and it shall be allowed to cool in a manner that will not impair the original properties of the metal. Proposed flame cutting of material other than structural steel shall be subject to approval and shall be indicated on detail drawings. Shearing shall be accurate and all portions of the work shall be neatly finished. Corners shall be square and true unless otherwise shown. Re-entrant cuts shall be filleted to a minimum radius of 3/4 inch unless otherwise approved. Finished members shall be free of twists, bends and open joints. Bolts, nuts and screws shall be tight.

2.2.1.1 Dimensional Tolerances for Structural Work. Dimensions shall be measured by an approved calibrated steel tape of approximately the same temperature as the material being measured. The overall dimensions of an

assembled structural unit shall be within the tolerances indicated on the drawings or as specified in the particular section of these specifications for the item of work. Where tolerances are not specified in other sections of these specifications or shown, an allowable variation of 1/32 inch is permissible in the overall length of component members with both ends milled and component members without milled ends shall not deviate from the dimensions shown by not more than 1/16 inch for members 30 feet or less in length and by more than 1/8 inch for members over 30 feet in length.

2.2.1.2 Structural Steel Fabrication. Structural steel may be cut by mechanically guided or hand-guided torches, provided an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Surfaces and edges to be welded shall be prepared in accordance with AWS D1.1, Subsection 3.2. Where structural steel is not to be welded, chipping or grinding will not be required except as necessary to remove slag and sharp edges of mechanically guided or hand-guided cuts not exposed to view. Hand-guided cuts which are to be exposed or visible shall be chipped, ground or machined to sound metal.

2.2.2 Welding

2.2.2.1 Welding of Structural Steel

a. Welding Procedures for Structural Steel - Welding procedures for structural steel shall be prequalified as described in AWS D1.1, Subsection 5.1 or shall be qualified by tests as prescribed in AWS D1.1, Section 5. Properly documented evidence of compliance with all requirements of these specifications for previous qualification tests shall establish a welding procedure as prequalified. For welding procedures qualified by tests, the test welding and specimen testing must be witnessed and the test report document signed by the Contracting Officer. Approval of any welding procedure will not relieve the Contractor of the responsibility for producing a finished structure meeting all requirements of these specifications. The Contractor will be directed or authorized to make any changes in previously approved welding procedures that are deemed necessary or desirable by the Contractor Officer. The Contractor shall submit a complete schedule of welding procedures for each steel structure to be welded. The schedule shall conform to the requirements specified in the provisions AWS D1.1, Sections 2, 3, 4, 7 and 9 and applicable provisions of Section 10. The schedule shall provide detailed procedure specifications and tables or diagrams showing the procedures to be used for each required joint. Welding procedures must include filler metal, preheat, interpass temperature and stress-relief heat treatment requirements. Each welding procedure shall be clearly identified as being prequalified or required to be qualified by tests. Welding procedures must show types and locations of welds designated or in the specifications to receive nondestructive examination.

b. Welding Process - Welding of structural steel shall be by an electric arc welding process using a method which excludes the atmosphere from the molten metal and shall conform to the applicable provisions of AWS D1.1, Sections 1 thru 7, 9, 10 and 11. Welding shall be such as to minimize residual stresses, distortion and shrinkage.

c. Welding Technique

(1) Filler Metal - The electrode, electrode-flux combination and grade of weld metal shall conform to the appropriate AWS specification for the base metal and welding process being used or shall be as shown where a specific choice of AWS specification allowables is required. The AWS designation of the electrodes to be used shall be included in the schedule of welding procedures. Only low hydrogen electrodes shall be used for manual shielded metal-arc welding regardless of the thickness of the steel. A controlled temperature storage oven shall be used at the job site as prescribed by AWS D1.1, Subsection 4.5 to maintain low moisture of low hydrogen electrodes.

(2) Preheat and Interpass Temperature - Preheating shall be performed as required by AWS D1.1, Subsection 4.2 and 4.3 or as otherwise specified except that the temperature of the base metal shall be at least 70 degrees F. The weldments to be preheated shall be slowly and uniformly heated by approved means to the prescribed temperature, held at that temperature until the welding is completed and then permitted to cool slowly in still air.

(3) Stress-Relief Heat Treatment - Where stress relief heat treatment is specified or shown, it shall be in accordance with the requirements of AWS D1.1, Subsection 4.4 unless otherwise authorized or directed.

d. Workmanship - Workmanship for welding shall be in accordance with AWS D1.1, Section 3 and other applicable requirements of these specifications.

(1) Preparation of Base Metal - Prior to welding the Contractor shall inspect surfaces to be welded to assure compliance with AWS D1.1, Subsection 3.2.

(2) Temporary Welds - Temporary welds required for fabrication and erection shall be made under the controlled conditions prescribed for permanent work. Temporary welds shall be made using low-hydrogen welding electrodes and by welders qualified for permanent work as specified in these specifications. Preheating for temporary welds shall be as required by AWS D1.1 for permanent welds except that the minimum temperature shall be 120 degrees F in any case. In making temporary welds arcs shall not be struck in other than weld locations. Each temporary weld shall be removed and ground flush with adjacent surfaces after serving its purpose.

(3) Tack Welds - Tacks welds that are to be incorporated into the permanent work shall be subject to the same quality requirements as the permanent welds and shall be cleaned and thoroughly fused with permanent welds. Preheating shall be performed as specified above for temporary welds. Multiple-pass tack welds shall have cascaded ends. Defective tack welds shall be removed before permanent welding.

2.2.2.2 Welding of Steel Studs. The procedures for welding steel studs to structural steel, including mechanical, workmanship, technique, stud application qualification, production quality control and fabrication and verification inspection procedures shall conform to the requirements of AWS D1.1, Section 7, except as otherwise specified.

a. Application Qualification for Steel Studs - As a condition of approval of the stud application process, the Contractor shall furnish certified test reports and certification that the studs conform to the requirements of AWS D1.1, Subsections 7.2 and 7.3, certified results of the stud manufacturer's stud base qualification test, and certified results of the stud application qualification test as required by AWS D1.1, Subsection 7.6, except as otherwise specified.

b. Production Quality Control - Quality control for production welding of studs shall conform to the requirements of AWS D1.1, Subsection 7.7, except as otherwise specified. Studs on which pre-production testing is to be performed shall be welded in the same general position as required on production studs (flat, vertical, overhead or sloping). If the reduction of the length of studs becomes less than normal as they are welded, welding shall be stopped immediately and not resumed until the cause has been corrected.

2.2.3 Bolted Connections.

2.2.3.1 Bolted Structural Steel Connections. Bolts, nuts and washers shall be of the type specified or indicated. All nuts shall be equipped with washers except for high strength bolts. Beveled washers shall be used where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis. Where the use of high strength bolts is specified or indicated the materials, workmanship and installation shall conform to the applicable provisions of ASTM A 325 or ASTM A 490.

a. Bolt Holes - Bolt holes shall be accurately located, smooth, perpendicular to the member and cylindrical. Holes for high strength bolts shall have diameters of not more than 1/16 inch larger than bolt diameters. If the thickness of the material is not greater than the diameter of the bolts the holes may be punched. If the thickness of the material is greater than the diameter of the bolts the holes may be drilled full size or subpunched or subdrilled at least 1/8 inch smaller than the diameter of the bolts and then reamed to full size. Poor matching of holes will be cause for rejection. Drifting occurring during assembly shall not distort the metal or enlarge the holes. Reaming to a larger diameter of the next standard size bolt will be allowed for slight mismatching.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS. The Contractor shall have required material tests and analyses performed and certified by an approved laboratory to demonstrate that materials are in conformity with the specifications. These tests and analyses shall be performed and certified at the Contractor's expense. Tests, inspections, and verifications shall conform to the requirements of the particular sections of these specifications for the respective items of work unless otherwise specified or authorized. Tests shall be conducted in the presence of the Contracting Officer if so required. The Contractor shall furnish specimens and samples for additional independent tests and analyses upon request by the Contracting

Officer. Specimens and samples shall be properly labeled and prepared for shipment.

2.3.1 Nondestructive Testing. When doubt exists as to the soundness of any material part such part may be subjected to any form of nondestructive testing determined by the Contracting Officer. This may include ultrasonic, magnaflux, dye penetrant, x-ray, gamma ray or any other test that will thoroughly investigate the part in question. The cost of such investigation will be borne by the Government. Any defects will be cause for rejection and rejected parts shall be replaced and retested at the Contractor's expense.

2.3.2 Inspection and Testing of Steel Stud Welding. Fabrication and verification inspection and testing of steel stud welding shall conform to the requirements of AWS D1.1, Subsection 7.8 except as otherwise specified. The Contracting Officer will serve as the verification inspector. One stud in every 10 and studs that do not show a full 360 degree weld flash, have been repaired by welding or whose reduction in length due to welding is less than normal shall be bent or torque tested as required by AWS D1.1, Subsection 7.8. If any of these studs fail two additional studs shall be bent or torque tested. If either of the two additional studs fail all of the studs represented by the tests shall be rejected. Studs that crack under testing in either the weld, base metal or shank shall be rejected and replaced by the Contractor at no additional cost.

PART 3 EXECUTION

3.1 INSTALLATION. All parts to be installed shall be thoroughly cleaned. Packing compounds, rust, dirt, grit and other foreign matter shall be removed. Holes and grooves for lubrication shall be cleaned. Enclosed chambers or passages shall be examined to make sure that they are free from damaging materials. Where units or items are shipped as assemblies they will be inspected prior to installation. Disassembly, cleaning and lubrication will not be required except where necessary to place the assembly in a clean and properly lubricated condition. Pipe wrenches, cold chisels or other tools likely to cause damage to the surfaces of rods, nuts or other parts shall not be used for assembling and tightening parts. Bolts and screws shall be tightened firmly and uniformly but care shall be taken not to overstress the threads. When a half nut is used for locking a full nut the half nut shall be placed first and followed by the full nut. Threads of all bolts except high strength bolts, nuts and screws shall be lubricated with an approved lubricant before assembly. Threads of corrosion-resisting steel bolts and nuts shall be coated with an approved antigalling compound. Driving and drifting bolts or keys will not be permitted.

3.2 TESTS

3.2.1 Workmanship. Workmanship shall be of the highest grade and in accordance with the best modern practices to conform with the specifications for the item of work being furnished.

3.2.2 Production Welding. Production welding shall conform to the requirements of AWS D1.1 or AWS D1.2as applicable. Studs on which pre-production testing is to be performed shall be welded in the same general position as required on production items (flat, vertical, overhead or sloping). Test and production stud welding will be subjected to visual examination or inspection. If the reduction of the length of studs becomes

less than normal as they are welded, welding shall be stopped immediately and not resumed until the cause has been corrected.

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